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ABSTRACT

A study investigated the effects of introducing a time delay between a "what question" and a verbal model on the spontaneous production of novel object words. Monolingual Spanish-speaking, Mexican children were taught the English names for toys. In the control condition, a "what question" was followed promptly by modeling the correct English label. In the experimental condition, a time delay was introduced between the "what question" and the verbal model. During training sessions, control children produced more imitative English words and experimental children produced more spontaneous English words. On post-tests, experimental children's production of English labels was superior to that of control children. No differences were found in comprehension levels. The role of time delay in spontaneous language use is discussed. (Author/MSE)

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FACILITATING SPONTANEOUS SPEECH THROUGH TIME DELAY

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ABSTRACT

The effects of introducing a time delay between a "what question" and a verbal model on the spontaneous production of novel object words were examined. Monolingual, Spanish-speaking, Mexican children were taught the English names for toys. In the control condition, a "what question" was followed promptly by modeling the correct English label. In the experimental condition, a time delay was introduced between the "what question" and the verbal model. During training sessions, control children produced more imitative English words and experimental children produced more spontaneous English words. On post-tests experimental children's production of English labels was superior to that of control children. No differences were found in comprehension. The role of time delay in spontaneous language use is discussed.

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* These data were presented in a poster session at the Biennial Convention of the Society for Research in Child Development, April 27-30, 1989. Kansas City, MO.

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Research on language learning has been characterized by a large division between the work directed to the study of normal and abnormal language acquisition. Although there has been a recent movement on the part of researchers working with language-handicapped children to study factors present in the natural learning environment, most researchers concerned with normal language learning have remained unfamiliar with the advances produced in the work with handicapped populations.

One contribution that research with language disordered children offers to research on normal language acquisition is the identification of a variety of non-linguistic factors that facilitate language acquisition. The present work is part of a research program evaluating the effects on normal children of factors that have been shown to contribute significantly to the language learning process of handicapped children with normal children. Several studies have demonstrated that introducing a time delay when a verbal response is expected results in increased rates of spontaneous language with autistic (Charlop, Schreibman, & Garrison-Thibodeau, 1985) and mentally retarded children (e.g., Halle, Baer, & Spradlin, 1981; Halle, Hunt & Bjorenson, 1984). This study will examine the effects of this variable with normal children.

The time delay manipulation was presented within the context of "what questions" to simulate naturally occurring parent-child verbal exchanges. In the natural environment, parents do not systematically delay the presentation of verbal models to their children. However, time delays are likely to be present in the context of "what-questions." Parents frequently ask "what questions" to teach or test their children's knowledge (e.g., Howe, 1981; Moerk, 1974, 1977; Ninio & Bruner, 1978; Shatz, 1979; Whitehurst, Fischel, Lonigan, et al., 1987). During a commonly observed language interaction, parents ask a "what question" requiring the children to label an object or action. If the child fails to respond, the parent then provides a model of the correct label. The time a parent waits to model the expected answer may play an important role in facilitating a child's future correct performance.

"Question-asking" interactions appear to play a role in assisting children to produce recently acquired words spontaneously (e.g., Moerk, 1974). However, it seems obvious that asking a string of "what questions" without giving the child the time and opportunity to respond would do very little for the child's language learning process. The work with language-handicapped children cited above suggests that the time a parent waits before modeling the expected answer may be an important component of the role of what-questions in the natural verbal exchanges. Following from this hypothesis, this study evaluates whether lengthening the time between a "what question" and a verbal model, will result in an increase in spontaneous productions by normal children.

Method

Subjects

Twenty Mexican children, twelve boys and eight girls, ranging in age from 28 to 39 months ($\underline{X}$=34.8) participated in this study. All subjects were monolingual, Spanish-speaking, normally developing children from middle and upper-middle class families. Children were randomly assigned to a control or experimental condition.

Setting and Materials

The study was conducted in a lounge located in a family recreational center in Mexico. The room contained common furniture and several children's books. An audio-tape recorder, placed in the middle of the room, was used to record training sessions. A chronometer was used to time the delay between the presentation of a "what question" and a verbal model.

Twelve unfamiliar toys, previously demonstrated to be highly attractive to children in this age group, were used as the stimulus materials. These toys were placed on a bookcase, within sight but out of reach of the children.

Dependent Variables.

Children's verbal productions were categorized according to the system presented in Table 1.

Table 1.

Definitions and Examples of Children's Verbal Behavior Categories

Definitions	Examples
ENGLISH WORDS: Production of any English word or its approximation.	Clown/'own.
Subtypes of English words:	
Imitative: English word produced following within 10 seconds a verbal model.	E: This is a clown C: Clown.
Prompted: English word produced following a "what question" in the absence of a verbal model in the preceding 10 seconds.	E: What do you want? C: Clown.
Spontaneous: English word produced in the absence of either a what question or a verbal model in the preceding 10 seconds.	C: Clown.
SPANISH NAMES: Productions of the Spanish names of the stimuli toys.	Payaso. *(Clown)*
SPANISH REQUESTS: Requests for any of the stimuli toys in Spanish. They may or may not include the Spanish name for the toy.	C: Me lo presta? *(May I have it?)*
STATEMENTS RELATED TO THE STIMULI TOYS: Comments in Spanish concerning any of the stimulus toys.	Que lindo payaso! *(That's a nice clown!)*
STATEMENTTS *NOT* RELATED TO THE STIMULI TOYS: Comments in Spanish about events not related to the stimuli toys.	C: Nade mucho. *(I swam a lot)*

Procedure

Children were matched for chronological age and members of each age-matched pair were randomly assigned to the control and experimental conditions. Eighteen individual training sessions were conducted over a 4 to 5 week period for all children. All training sessions were audio-recorded.

During the training sessions, all children were exposed to an environment in which only English was spoken. In order to gain access to toys placed out of their reach, children had to produce the English label of the desired object. When a child requested a toy using its Spanish label or through gestures, the experimenter prompted the child to produce the English label by asking a what question (i.e., What do you want?"). Subsequently, the experimenter modeled the correct response three times while holding the desired object.

In the control condition, the what question was always promptly followed by the modeling episode. The experimental condition was identical to the control condition during the initial six sessions. From the seventh to the sixteenth, a 10-second silent pause was gradually introduced between the what question and the verbal model. During the last two sessions no model was provided.

After training, individual tests of children's comprehension and production of the toys' English labels were performed. Assessment was conducted only with those toys that had been labeled by the experimenter for the child. The production test was conducted prior to the comprehension test.

Results

Analyses of the children's verbal productions during training were performed using the MANOVA approach to repeated measures designs (Bock, 1982). Data from the 18 training sessions were reduced to 9 data points for trials, representing the sum of 2 adjacent sessions (i.e., sessions 1 and 2 were combined in trial 1, sessions 3 and 4 were combined in trial 2, etc.). Separate two group (experimental group vs. control group) by nine trials MANOVAs were conducted for each of the 5 verbal behavior categories and for each of the 3 subtypes of English words. None of the analyses of the five verbal categories revealed a significant main effect for experimental condition or a significant interaction between experimental condition and trials.

Analyses of the types of English words revealed that, although children in the experimental and control groups produced a comparable number of English words, these words were produced under different conditions. Control children produced more imitative English words [$F(1,18)=11.343$, $p=.003$] (See Figure 1), and experimental children produced more spontaneous words [$F(1,18)=12.7$, $p=.002$] (See Figure 2) and prompted words (i.e., following the what question) [$F(1,18)=35.47$, $p<.001$] (See Figure 3).

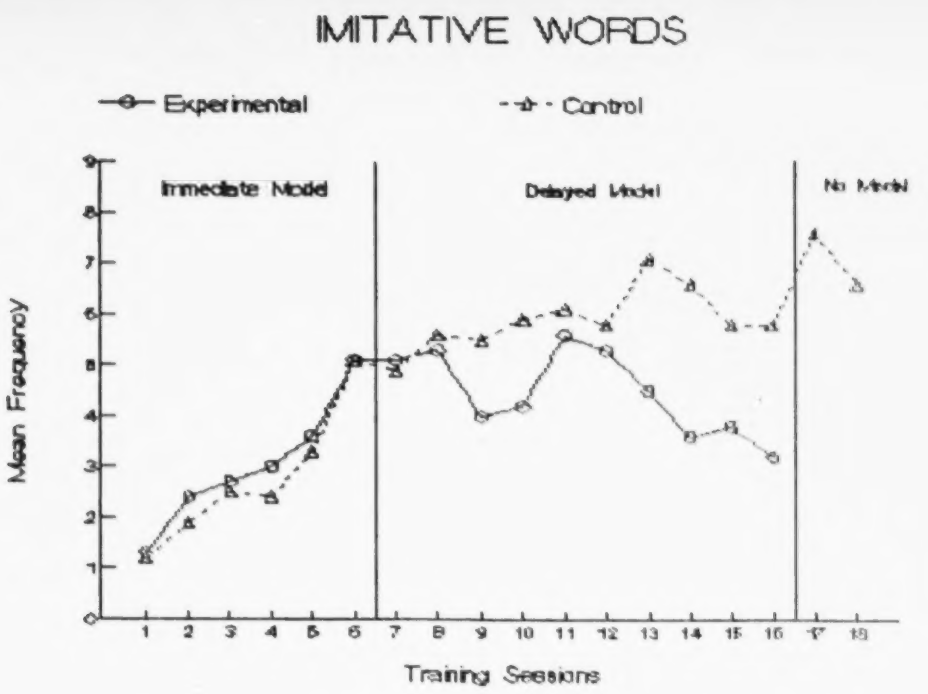

FIG.1.--Mean Frequency per session per child of use of imitative English words by children in the time delay and control conditions.

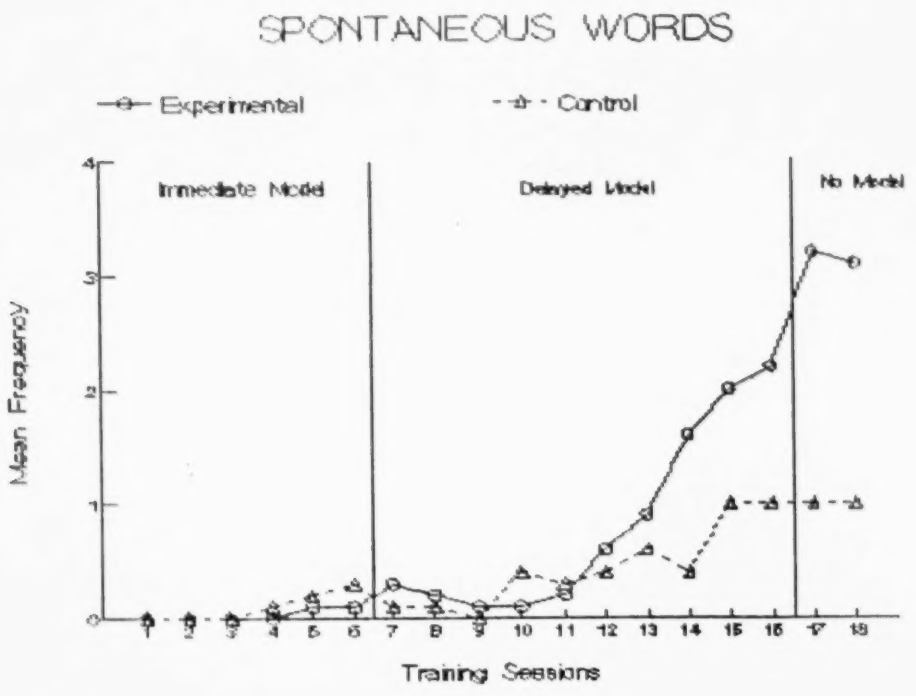

FIG.2.--Mean Frequency per session per child of use of spontaneous English words by children in the time delay and control conditions.

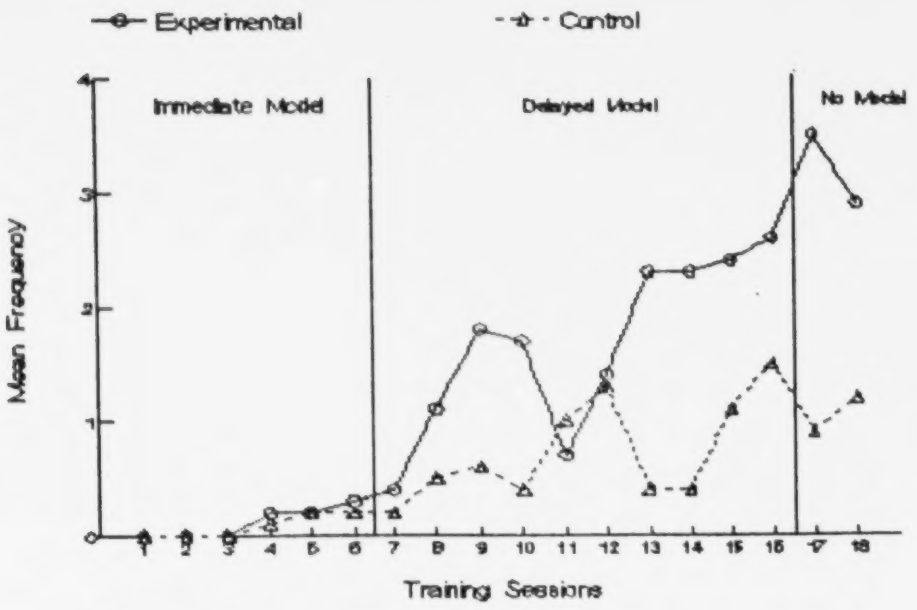

FIG.3.--Mean Frequency per session per child of use of prompted English words by children in the time delay and control conditions.

Two one-way ANOVAs were used to assess experimental effects on the production and comprehension tests of the English words. These analyses indicated that experimental children's production of English labels was superior to that of control children [$F(1,18)=37.64$, $p<.001$]. No differences were found in comprehension.

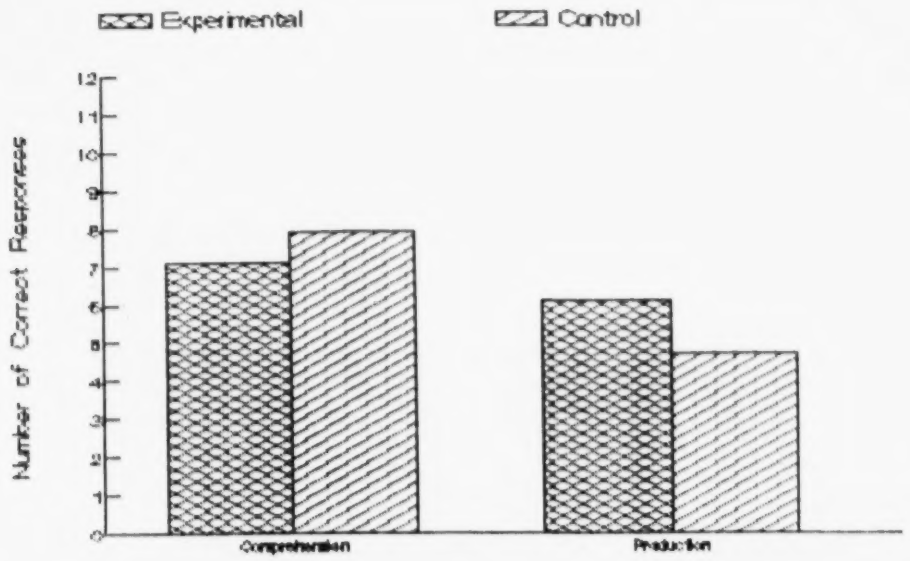

FIG.4.--Mean Frequency of Correct Responses per child on the comprehension and production of English labels by children in the time delay and control conditions.

Discussion

The present work demonstrates that, as with handicapped children, introducing a time delay between a cue and a verbal model results in higher rates of spontaneous speech in normally developing children. Also the use of the delay procedure resulted in superior performance on the production test by the experimental children compared to their controls.

A differential response-efficiency process appears to be operative in these effects. The experimental manipulation introduced a motivational change for the production of prompted and spontaneous words by changing the efficiency of the different types of English words. By temporally removing the verbal models, the prolonged time delay undermined the reinforcing value of imitative words and strengthened the contingencies for prompted and spontaneous production. That is, in the time delay condition, if a child wanted immediate access to the toys, this could only be achieved through producing prompted or spontaneous words.

This research has important implications for the extensive literature that associates the frequency of maternal use of "what questions" with linguistic functions (e.g., Ninio, 1980; Olsen-Fulero & Conforti, 1983; Snow, 1977). By demonstrating that different levels of language production may be obtained despite similar exposure to "what questions," this study points out that the frequency of "what questions", per se, may not be the only relevant factor. The length of the pause provided after the "what question" seems also to play a critical role. This is not to say that, the longer the time delay the greater the effects. Informal observations while conducting this study suggest that the optimal length of time may be within a limited range.

This research is also relevant for the literature on turn-taking. Sacks, Schegloff, and Jefferson (1974) have pointed out that children's ability to maintain an interaction depends not only on being able to assume their turn, but also on their ability to recognize that the other person's turn has terminated. Mothers of young children have been observed to use diverse cues to indicate to their children when it is time for them to take a turn (e.g., Clark, 1978; Ratner & Bruner, 1978). The introduction of a time delay may have had a similar function. By remaining silent and attentive, the experimenter clearly indicated that it was the child's turn to talk, and accentuated the demands for children to assume their turn. Thus, it appears that children's turn-taking skills could be fostered if mothers wait for their children to produce a response. It remains to be determined whether the presentation of a time delay without a preceding "what question" would result in similar findings to those observed in this study.

In sum, the present research points out the importance of studying non-linguistic factors that may operate in the learning environment of young children. While it is often recognized that children do not learn language in a vacuum, existing literature on language acquisition has, by and large, disregarded the role of non-linguistic factors. Focus on these factors, in addition to the typical qualitative measures of verbal input, should provide us with a clearer picture of the learning environment of the young child and bring new insights to our understanding of how language is learned.

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